INTERNATIONAL CIVIL AVIATION ORGANISATION

REPORT
OF
THE ICAO ASIA/PACIFIC FLIGHT INSPECTION AND PROCEDURE VALIDATION (FIPV) SEMINAR 2024

Bangkok, Thailand

30 July to 1 August 2024

The views expressed in this Report should be taken as those of the Meeting and not the Organisation.

Approved by the Meeting and published by the ICAO Asia and Pacific Office, Bangkok

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1. Introduction

1.1 The ICAO Asia/Pacific Flight Inspection and Procedure Validation (FIPV) Seminar 2024 was held from **30 July to 1 August 2024** at the ICAO Asia and Pacific Regional Office, Bangkok, Thailand. The Seminar was organised in view of Significant Safety Concerns (SSCs) raised during Universal Safety Oversight Audit Programme (USOAP) Audits in some APAC Member States/Administrations due to Instrument Flight Procedure (IFPs) not meeting the quality assurance requirements. The Seminar also provided an opportunity to exchange and deliberate the FIPV methods for newly implemented facilities such as PBN procedures, GBAS, ADS-B, etc., as well as related experiences from different perspectives.

2. Attendance

2.1 The Seminar was attended by **50** participants from **12** States/Administrations, one International Organisation and **4** industry partners, including Cambodia, China, Hong Kong China, Macau China, France, India, Italy, Malaysia, Philippines, Republic of Korea, Thailand, Viet Nam, Aerodata, Aeropearl, Beijing Sky Aviation, Radiola. Aerodata and Beijing Sky Aviation positioned an exhibition booth during the Seminar. The list of participants is provided in **Attachment 1.**

3. Officers and Secretariat

3.1 Ms. Florence JACOLOT, Senior Engineer, DSNA/DTI/CNS/CEV - Contrôle En Vol/ Flight Inspection, and Mr. Fabrizio Maracich, Senior Captain, TRI/TRE.Sr., Flight Crew Training Postholder, Enav S.p.A moderated and chaired the Seminar.

3.2 Ms. Soniya Nibhani, Regional Officer ANS (CNS) Implementation, facilitated the Seminar with the support of Ms. Varapan Meefuengsart, the Programme Assistant from the ICAO Asia and Pacific Regional Office.

4. Organisation, Working Arrangements, Language, and Documentation

4.1 The Seminar was organised for three days. The working language was English, including all documentation and this Report.

5. Summary of Presentations

5.1 A total of **Fourteen** (14) presentations were delivered by Experts from various States/Administrations and Industries. The presentation materials can be accessed by the link.

6. Key Discussions/Outcomes of the Seminar

6.1. The Meeting was informed about some key information as follows:

a) ICAO documents such as Doc 8071, Doc 10068, and Doc 9906 are guidance materials only. States need to adhere to the State regulatory framework formulated based on State needs.

b) The State regulatory framework is foreseen at the Annex and PANS level and States should be aware that the requirement cannot be dispensed of. Doc 10068 provides guidance on how a regulatory framework for the provision of an **Instrument Flight Procedure Design Service** (IFPDS) may be implemented. This guidance material aims to enhance compliance with the IFPDS SARPs found in Annex 11.

c) Instrument flight procedures shall be designed in accordance with State-approved design criteria

and an instrument flight procedure design service provider intending to design an instrument flight procedure for aerodromes or airspace under the authority of that State should meet the requirements established by that State's regulatory framework for the design, validation and approval.

d) Each State shall establish an interval for periodic review of instrument flight procedures not exceeding five years. However, States can decide the periodicity of flight procedures re/validation based on national requirements, but not exceeding five years.

e) The Minimum Operational Network (MON) concept while implementing procedures based on GNSS for certification of aerodromes was shared. It was noted that it is imperative to define this minimum network and contingency procedures to operate to and from those airports in case of major GNSS failure. The MON should be considered a strategic asset by each State in order to guarantee international and domestic air transport operations.

f) Several years ago, when the concept of a future GNSS network was being developed, it was anticipated that GNSS would 'replace' the conventional Nav Aids that would become back-ups. However, considering the safety-related issues encountered in recent years, such as GNSS interference and spoofing, the tendency is now to consider conventional navaids complementary to GNSS rather than backup. Terrestrial navigation aids continue to be essential to maintain safe aviation operations.

6.2. On the question about the stakeholders needed to be involved in the decision to conduct simulator flight validation and/or aircraft flight validation, the Chair informed that the person responsible for each step of the validation process is defined in ICAO Doc 9906. It was added that under the pre-flight validation stage of the flight validation process mentioned in ICAO Doc 9906, Vol V, edition 2, the person responsible for the flight validation is the flight validation pilot, with the help of other stakeholders if necessary. It was recommended that the responsibilities be clearly defined in the State regulatory framework for each process step, using the guidance provided in Doc 9906 volume 5.

6.3. The Meeting agreed that Flight Inspection must employ methods that enable flight inspection in GNSS-challenging environments. The Meeting noted the way to enhance GNSS resilience during flight inspection using Multi Constellation and anti-jamming technology using multi-constellation capability in GNSS-denied/challenged environments. Some solutions for anti-jamming technology for GNSS were shared with the Meeting. The Meeting was informed by participating industries that antijamming systems are currently usable for flight inspection operations only and can be enhanced for procedure validation in future.

6.4. The Meeting noted the APAC Flight Procedure Programme (FPP) and its objectives to assist States in developing sustainable capability in the instrument flight procedure (IFP) domain to meet their commitments under Assembly Resolutions relating to PBN implementation and their obligations for the quality of their flight procedures. The strategy forward and the scope of activities for Phase 5 of FPP were shared with the Meeting. The procedure to become a member of FPP and associated benefits were explained.

Open discussion on "RPAS and Flight Inspection"

6.5. On Day-2 (31 July 2024), an open discussion on "RPAS and Flight Inspection" was led by Mr. Fabrizio Maracich, the Co-Chair of the event. The Meeting deliberated on four critical aspects, including Regulatory/Safety, Technical, Logistics/Operations and a potential Business case for the use of RPAS for flight inspection. The presentation used to moderate the open discussion session can be accessed here.

6.6. For regulatory aspects, the Meeting deliberated on the issues of fragmented State regulations and non-standardised safety assessment standards for using RPAS for flight inspection and procedure

validation. Other regulatory aspects, such as airspace segregation, the need for night operations, tactical decisions and medium to long-term integration of RPAS into airspace, were highlighted. The Meeting shared an agreement regarding the progression of RPAS's technical capabilities to perform the required operations. However, it was concurred that several issues related to logistics and operations are still under discussion. Given the uncertainty of the concrete information necessary to build a good business case, the Meeting shared the key stakeholders' inability to decide to invest. Therefore, it was shared that pursuing full flight inspection capabilities with an RPAS may not be financially wise. Nonetheless, RPAS can complement and support current flight inspection and procedure validation capabilities.

6.7. The Meeting encouraged States/Administrations to take initiatives to use RPAS for additional ground inspection and other important usage within airport boundaries, such as supporting risky evaluation of antenna masts (including radars), employing a human engineer only when strictly necessary, continuity of service (radar antennas can be checked while still in operation), and airport security. It was added that RPAS will improve the way flight inspection is conducted and can be used to reduce the use of a flight inspection aircraft and increase the periodicity of the NAVAID supported by RPAS ground measurements, provided that a good correlation is established.

6.8. The use of RPAS should be subject to a local safety assessment and local business case evaluation to determine the suitability of the operation. Local conditions may preclude the efficient use of RPAS, and this should be taken into account for the development of a proper utilisation framework (e.g. prevailing weather phenomena limiting the RPAS operations, like constant winds, seasonal rains, or the RFI environment, must be considered).

Open discussion on "GNSS Radio Frequency Interference (RFI)"

6.9. On Day-3 (1 August 2024), an open discussion on "GNSS RFI" was led by Ms. Florence JACOLOT, the Co-Chair of the event. The presentation used to moderate the open discussion session can be accessed here. Ms Jacolot introduced the concept of GNSS RFI and its impact on aviation. The Meeting recalled ICAO Assembly Resolution 41-8C about the need to develop interference detection, mitigation and reporting capabilities. The Meeting noted various tools and methods for GNSS RFI detection and mitigation. Different relevant International Telecommunications Union (ITU) Radio Regulations were explained.

6.10. The Meeting emphasised the importance of a robust regulatory framework governing intentional in-band radiators, including GNSS repeaters, pseudolites, spoofers and jammers. The necessity of onboard navigation systems and the independence of all other systems or hybridisation were deliberated. Examples of such solutions may include ADS-B position based on multi-sensor, not only GNSS for surveillance, EGPWS/TAWS position input based on multi-sensor, not only GNSS, and anti-jamming on board. The Meeting encouraged sharing GNSS RFI reporting and participating in open forums to discuss such issues and potential resolutions.

7. Closing of Seminar

7.1 Mr. Fabrizio Maracich and Ms. Florence JACOLOT expressed their gratitude to the delegates for their active participation and contribution, especially in sharing ideas and questions. At the wrap-up session, they summarised the key messages from each presentation. Based on the outcomes of the Q&A session, the following further dialogues and actions were recommended:

a) Catalogue of APAC Flight Inspection and Flight Validation Service Providers was discussed for potential amendments in the template to incorporate additional information about "Flight inspection using RPAS". It was agreed that the approved template must not be amended until APAC States/Administrations have associated regulatory frameworks for using RPAS for Flight inspection and validation. The current filled template will be shared with APAC States/Administrations individually to provide the latest information from ANSPs/CAAs. The

ICAO APAC Office will publish a new catalogue edition after compiling necessary information from APAC States/Administrations.

b) The Meeting agreed to prepare a questionnaire to understand the current status of the usage of RPAS in support of flight inspection in APAC Member States/Administrations and conduct the survey while updating the catalogue. The ICAO Secretariat will prepare the survey with the help of Chairs and share it with Member States/Administrations to respond while circulating catalogue updates.

7.2 The Seminar was informed that an additional **Workshop on Oversight of Instrument Flight Procedures (IFPs) for CAAs** is being conducted from **29-30 October 2024 in Nadi, Fiji**. The content of the workshop will remain the same as in the first workshop conducted from 25 to 26 March 2024 in Bangkok, Thailand. The detailed information about the event along with agenda items, can be accessed at this link.

7.3 The ICAO Secretariat sincerely appreciated Mr. Fabrizio Maracich and Ms. Florence JACOLOT for moderating and chairing the event. She also shared gratitude to all speakers for joining the Seminar and sharing the information with APAC Member States/Administrations. Lastly, she expressed appreciation and thankfulness to the event participants. Lastly, the Chairs praised the ICAO Secretariat for a well-organised and managed event.

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